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**BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES**

Application Number: 10/765,402  
Filing Date: January 27, 2004  
Appellant(s): DUNFIELD ET AL.

**MAILED**  
**FEB 22 2007**  
**GROUP 1700**

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Donald J. Coulman  
For Appellant

**EXAMINER'S ANSWER**

This is in response to the appeal brief filed 10/31/2006 appealing from the Office action mailed 5/31/2006.

**(1) Real Party in Interest**

A statement identifying by name the real party in interest is contained in the brief.

**(2) Related Appeals and Interferences**

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

**(3) Status of Claims**

The statement of the status of claims contained in the brief is correct.

**(4) Status of Amendments After Final**

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

**(5) Summary of Claimed Subject Matter**

The summary of claimed subject matter contained in the brief is correct.

**(6) Grounds of Rejection to be Reviewed on Appeal**

The appellant's statement of the grounds of rejection to be reviewed on appeal is substantially correct. The changes are as follows:

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Claims 50-55 are rejected under 35 U.S.C. 103(a) as being unpatentable over Loughman in view of Boucher.

Extracted from Advisory Action mailed on 8/15/2006: It is noted that claims 50-55 should have been included in the Formal Rejection of Paragraph 36 of the Office Action mailed on 5/31/2006 and Paragraph 33 of the Office Action mailed on 12/16/2005. However, claims 50-55 were specifically discussed in the rejection. Albeit examiner regrets that this issue was not set forth earlier, it is not seen to constitute a burden to appellant.

#### **GROUNDS OF REJECTION NOT ON REVIEW**

The following grounds of rejection have not been withdrawn by the examiner, but they are not under review on appeal because they have not been presented for review in the appellant's brief.

Claims 29, 30, 32, 33, 34, 39, 40, 41, 56, 57, 59, 60, 61, 66, and 67 are rejected under 35 U.S.C. 103(a) as being unpatentable over Loughman in view of Wang (US Patent No. 5,462,866).

#### **(7) Claims Appendix**

The copy of the appealed claims contained in the Appendix to the brief is correct.

**(8) Evidence Relied Upon**

WO 99/38535	Loughman, R. et al.	08-1999
US Pat. No. 6,641,254	Boucher et al.	11-2003
US Pat. No. 5,462,866	Wang, T	10-1995

**(9) Grounds of Rejection**

The following ground(s) of rejection are applicable to the appealed claims:

**Claim Rejections - 35 USC § 102**

Claims 1, 2, 4-8, 11-14, 17, 18, 46, 47, and 49 are rejected under 35 U.S.C. 102(b) as being anticipated by Loughman (WO 99/38535) (Page 9, Line 25 to Page 10, Line 35, Example VII).

In reference to claim 1 and 11, Loughman discloses a method for producing a microcapsule (referred to as a process of encasing the bound microparticles) comprising utilizing an ultrasonic atomizer where a dispersion of the first fluid (bound microparticles in an absorbable enclosing polymer solution) is ejected as microdroplets into a second fluid (cooled non-solvent medium). The ultrasonic atomizer of Loughman functions as a fluid ejector and is activated at a frequency of 12 to 36kHz. Each activation of the ultrasonic atomizer generates a drop (having a volume), wherein the ultrasonic atomizer is fluidically coupled to a first fluid including a core component. Loughman discloses that the first fluid includes bound microparticles, the core component. For each drop of first fluid ejected into the second fluid, the result is the generation of a microcapsule in the second fluid, wherein the microcapsule includes the core component (Page 9, Line 25 to Page 10, Line 35, Example VII).

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In reference to claim 2, each activation of the ultrasonic atomizer of Loughman generates a drop, hence the ultrasonic atomizer comprises activation of a drop on demand fluid ejector. Wherein activation of any automated ultrasonic atomizer results in ejection of a drop, hence it is considered to comprise a drop on demand fluid ejector.

In reference to claim 4, 5, and 6, each activation of the ultrasonic atomizer of Loughman generates a drop. Hence it is inherent each activation results in the activation of an energy generating element one time, ejecting one drop of first fluid into said second fluid. Wherein if the energy generating element is activated  $n$  times, then  $n$  drops of first fluid will be ejected into second fluid, where  $n$  is an integer. The  $n$  drops resulting from the ultrasonic atomizer inherently produce a distribution of drop volumes within 6 or 10 percent of a specified volume.

In reference to claims 7 and 8, the ultrasonic atomizer of Loughman produces a drop with volume in the range of 1 atto-liter to about 1 pico-liter.

In reference to claims 12 and 13, it is inherent that activation of the ultrasonic atomizer of Loughman comprises application of an electrical pulse charging a nozzle through which first fluid is ejected, and applying a voltage pulse to deflect a pre-selected number of drops. The deflected pre-selected number of drops are ejected into a recirculator.

In reference to claim 14, the ejection of a drop is inherently a pre-selected distance above the surface of the second fluid.

In reference to claims 17 and 18, the ejection of a drop comprises ejecting a drop of first fluid from a chamber (referred to as homogenizer by Loughman) through one nozzle formed in a nozzle layer, wherein the chamber has a greater volume than the nozzle.

In reference to claim 46, Loughman discloses a method for producing a microcapsule (referred to as a process of encasing the bound microparticles) comprising utilizing an ultrasonic atomizer

where a dispersion of the first fluid (bound microparticles in an absorbable encasing polymer solution) is ejected as microdroplets into a second fluid (cooled non-solvent medium). The ultrasonic atomizer of Loughman functions as a fluid ejector and is activated at a frequency of 12 to 36kHz. Each activation of the ultrasonic atomizer generates a drop (having a volume), wherein the ultrasonic atomizer is fluidically coupled to a first fluid including a core component. Loughman discloses that the first fluid includes bound microparticles, the core component. For each drop of first fluid ejected into the second fluid, the result is the generation of a microcapsule in the second fluid, wherein the microcapsule includes the core component. Each activation of the ultrasonic atomizer of Loughman generates a drop. Hence it is inherent each activation results in the activation of an energy generating element one time, ejecting one drop of first fluid into said second fluid. Wherein if the energy generating element is activated n times, then n drops of first fluid will be ejected into second fluid, where n is an integer. The n drops resulting from the ultrasonic atomizer inherently produces a distribution of n fluid drop volumes, wherein each drop volume is said n fluid drops is within about 10 percent of a specified drop volume (Page 9, Line 25 to Page 10, Line 35, Example VII).

In reference to claim 47, Loughman discloses a method of using an ultrasonic atomizer (fluid ejection device) comprising: utilization and activation of a drop on demand fluid ejection device. Wherein each activation of the ultrasonic atomizer of Loughman generates a drop, hence the ultrasonic atomizer comprises utilization and activation of a drop on demand fluid ejector. Wherein activation of any automated ultrasonic atomizer results in ejection of a drop, hence it is considered to comprise a drop on demand fluid ejector. The drop on demand fluid ejection device of Loughman ejects essentially a drop of a first fluid including a microcapsule forming core component into a second fluid; specifically, the ultrasonic atomizer ejects the first fluid as microdroplets into the

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second fluid. Loughman discloses that the first fluid includes bound microparticles, the core component. For each drop of first fluid ejected into the second fluid, the result is the generation of a microcapsule in the second fluid, wherein the microcapsule includes the core component (Page 9, Line 25 to Page 10, Line 35, Example VII).

In reference to claim 49, the ultrasonic atomizer of Loughman is inherently a pre-selected distance above the surface of the second fluid.

#### Claim Rejections - 35 USC § 103

Claims 3, 9, and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Loughman (WO 99/38535) as applied to claim 1 above, and further in view of Boucher et al. (US Patent No. 6,641,254).

Loughman fails to teach that the fluid ejector activation further comprises activation of a thermal resistor or a piezoelectric element, wherein when the thermal resistor is utilized then at least one component of the first fluid is heated above its boiling point. Hence attention is directed towards the Boucher reference.

Boucher teaches that it is well known in the fluid ejector art to utilize a fluid ejector comprising either a thermal resistor or a piezoelectric element, in order to utilize an energy generating element that produces the force necessary to eject the first fluid. Specifically, if the thermal resistor is employed, a component in the first fluid is rapidly heated above its boiling point causing ejection of a drop of the first fluid (2:2-10).

It would have been obvious to one of ordinary skill in the art at the time of the invention to have utilized the fluid ejector of Loughman with either a thermal resistor or a piezoelectric element in order to ensure sufficient force is present to eject the first fluid, as taught by Boucher.

Claims 15, 16, 19-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Loughman (WO 99/38535) as applied to claim 1 above.

In reference to claims 15, 16, 23 and 26-28, Loughman teaches the utilization of an ultrasonic atomizer, which ejects droplets of a first fluid into a second fluid. In reference to claims 15, 16, and 23, Loughman would contemplate the second fluid as a thin film in order to ensure minimal coating of the first fluid drop by the second fluid. The second fluid is stirred, resulting in the inherent flow of a thin film of the second fluid in a direction perpendicular to the axis of the fluid ejector head. In reference to claims 26-28 Loughman would contemplate the second fluid as a mist in order to ensure partial coating of the first fluid drop by the second fluid. In order to have the second fluid as a mist, it would have been obvious to utilize the same fluid ejector as utilized to form a drop of the first fluid. Specifically, it is necessary to activate a plurality of second fluid ejectors, which are coupled to the second fluid; the second fluid drops are ejected nearby to the drop of the first fluid, wherein the ejection from the plurality of second fluid ejectors results in the formation of a mist of the second fluid. Wherein if the same fluid ejectors are utilized for formation of droplets of the first and second fluids, it is inherent that the distribution of the second fluid drop volumes is within 10 percent of a specified second fluid drop volume.

It would have been obvious to one of ordinary skill at the time of the invention to form a microcapsule via the ultrasonic atomizer of Loughman, wherein the first fluid drop is ejected into either a thin film or a mist of the second fluid (in addition to the limitations in claims 16, 23, 27, and 28), in order to ensure minimal coating of the second fluid or ensure a partial shell around the first fluid drop.

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In reference to claims 19, 20, 22, 24, 25, Loughman teaches the utilization of an ultrasonic atomizer, which ejects droplets of a first fluid into a second fluid. In reference to claim 19, Loughman would contemplate a portion of the nozzle of the ultrasonic atomizer below the surface of the second fluid in order to ensure engulfment of the first fluid drop by the second fluid. In reference to claim 20, the second fluid is stirred, resulting in the inherent flow of the fluid in a direction perpendicular to the axis of the fluid ejector head. In reference to claim 25 and 24, the nozzle and head of the ultrasonic atomizer is capable of movement, and Loughman would envisage reciprocally translating the fluid ejector in a lateral direction in the second fluid, in order to maximize the number of microcapsules formed. Specifically, the ultrasonic atomizer would move in one lateral direction either in or over the second fluid, become activated at a pre-selected location, and eject a drop of first fluid into second fluid at the pre-selected location.

It would have been obvious to one of ordinary skill in the art at the time of the invention to have utilized the ultrasonic atomizer of Loughman wherein a portion of the nozzle is below the surface of the second fluid and to reciprocally translate the fluid ejector (in addition to the limitations of claims 19, 20, 22, 24 and 25), in order to ensure engulfment of the first fluid drop by the second fluid and to maximize the number of microcapsules formed.

In reference to claims 21, Loughman teaches the utilization of an ultrasonic atomizer, which ejects droplets of a first fluid into a second fluid. The nozzle and head of the ultrasonic atomizer is capable of movement, and Loughman would envisage reciprocally translating the fluid ejector in a lateral direction over the second fluid, in order to maximize the number of microcapsules formed. Specifically, the ultrasonic atomizer would move in one lateral direction over the second fluid, become activated at a pre-selected location, and eject a drop of first fluid into second fluid at the pre-selected location.

It would have been obvious to one of ordinary skill in the art at the time of the invention to utilize the ultrasonic atomizer of Loughman and to reciprocally translate the fluid ejector in order to maximize the number of microcapsules formed.

Claims 48 and 50-55 are rejected under 35 U.S.C. 103(a) as being unpatentable over Loughman (WO 99/38535) as applied to claim 47 above, and further in view of Boucher et al. (US Patent No. 6,641,254).

Loughman fails to teach that the energizing the fluid ejector further comprises energizing or activating a thermally activated fluid ejector. Hence attention is directed towards the Boucher reference.

Boucher teaches that it is well known in the fluid ejector art to utilize a fluid ejector comprising either a thermal resistor, in order to utilize an energy generating element that produces the force necessary to eject the first fluid and to rapidly heat a component in the first fluid above its boiling point causing ejection of a drop of the first fluid (2:2-10). Hence activation of Boucher's fluid ejector comprising a thermal resistor is considered energizing a thermally activated fluid ejector.

It would have been obvious to one of ordinary skill in the art at the time of the invention to have utilized the fluid ejector of Loughman with a thermal resistor in order to ensure sufficient force is present to eject the first fluid and to rapidly heat a component in the first fluid above its boiling point causing ejection of a drop of the first fluid, as taught by Boucher.

In reference to claims 50, 51, 52, 53, 54 and 55 Loughman teaches the utilization of an ultrasonic atomizer, which ejects droplets of a first fluid into a second fluid. In reference to claim 50, Loughman would contemplate a portion of the nozzle of the ultrasonic atomizer below the surface of the second fluid in order to ensure engulfment of the first fluid drop by the second fluid. In

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reference to claims 51, the second fluid is stirred, resulting in the inherent flow of the fluid in a direction perpendicular to the axis of the fluid ejector head. In reference to claims 52, 53, and 54 the nozzle and head of the ultrasonic atomizer is capable of movement, and Loughman would envisage reciprocally translating the fluid ejector in a lateral direction either in or over the second fluid, in order to maximize the number of microcapsules formed. Specifically, the ultrasonic atomizer would move in one lateral direction either in or over the second fluid, become activated at a pre-selected location, and eject n drops of first fluid into second fluid at n pre-selected lateral locations. In reference to claim 55, Loughman would contemplate the second fluid as a thin film in order to ensure minimal coating of the first fluid drop by the second fluid.

It would have been obvious to one of ordinary skill in the art at the time of the invention to have utilized the ultrasonic atomizer of Loughman wherein a portion of the nozzle is below or over the surface of the second fluid and to reciprocally translate the fluid ejector (in addition to the limitations of claims 50-55), in order to ensure engulfment of the first fluid drop by the second fluid, to maximize the number of microcapsules formed, and to ensure minimal coating of the first fluid drop by the second fluid.

Claims 29, 30, 32, 33, 34, 39, 40, and 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Loughman (WO 99/38535) as applied to claim 1 above, and further in view of Wang (US Patent No. 5,462,866).

Loughman fails to teach the limitations of the first fluid and second fluid components, as well as the specifics of the generation of a microcapsule as stated in claims 29, 30, 34, 39, and 40. Hence attention is directed towards the Wang reference.

Wang discloses a process to form semipermeable microspheres encapsulating biological material. Specifically, the microspheres are formed via a fluid ejector. In reference to claim 29, the first fluid comprises a polyanion solution mixed with a core component (plastic beads). In reference to claim 40, the generation of the microcapsule in the second fluid comprises forming a coacervate. Specifically, the generation of the microcapsule comprises generation of a chitosan alkali metal alginate microcapsule, as in claim 39. In reference to claim 34, the core component of Wang comprises whole blood cells, which inherently contain hemoglobin. (6:30-40, Example 1 & 5). In reference to claims 30, 32, and 33, Wang envisages a variety of components comprising the first and second fluid, one example includes a second fluid, which is immiscible in the first fluid. Another example is a first fluid including a core component and monomer and a second fluid including a core-reactant to the monomer, wherein the monomer and co-reactant form a polymer shell encapsulating the core component. One motivation for the selection of the aforementioned first and second fluids and the core component is to encapsulate biological material and to utilize polymers for the formation of polyelectrolyte complexes that are NIH approved for human implantation or that are naturally occurring water soluble polymers.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to have included the limitations of claims 29, 30, 32, 33, 34, 39, and 40 in the process of Loughman in view of the teachings of Wang in order to encapsulate biological materials and utilize polymer materials in the first and second fluid that are NIH approved for human implantation or that are naturally occurring water soluble polymers.

Claims 56, 57, 59, 60, 61, 66, and 67 are rejected under 35 U.S.C. 103(a) as being unpatentable over Loughman (WO 99/38535) as applied to claim 47 above, and further in view of Wang (US Patent No. 5,462,866).

Loughman fails to teach the limitations of the first fluid and second fluid components, as well as the specifics of the generation of a microcapsule as stated in claims 56, 57, 61, 66, and 67. Hence attention is directed towards the Wang reference.

Wang discloses a process to form semipermeable microspheres encapsulating biological material. Specifically, the microspheres are formed via a fluid ejector. In reference to claim 56, the first fluid comprises a polyanion solution mixed with a core component (plastic beads). In reference to claim 67, the generation of the microcapsule in the second fluid comprises forming a coacervate. Specifically, the generation of the microcapsule comprises generation of a chitosan alkali metal alginate microcapsule, as in claim 66. In reference to claim 61, the core component of Wang comprises whole blood cells, which inherently contain hemoglobin. (6:30-40, Example 1 & 5). In reference to claims 57, 59, and 60, Wang envisages a variety of components comprising the first and second fluid, one example includes a second fluid, which is immiscible in the first fluid. Another example is a first fluid including a core component and monomer and a second fluid including a core-reactant to the monomer, wherein the monomer and co-reactant form a polymer shell encapsulating the core component. One motivation for the selection of the aforementioned first and second fluids and the core component is to encapsulate biological material and to utilize polymers for the formation of polyelectrolyte complexes that are NIH approved for human implantation or that are naturally occurring water soluble polymers.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to have included the limitations of claims 56, 57, 59, 60, 61, 66, and 67 in the process of

Loughman in view of the teachings of Wang in order to encapsulate biological materials and utilize polymer materials in the first and second fluid that are NIH approved for human implantation or that are naturally occurring water soluble polymers.

#### (10) Response to Arguments

##### 35 USC § 102

Claim 1:

Appellants have essentially argued that the examiner's rejection of independent claim 1 as being anticipated by Loughman is based on the improper interpretation of three different elements/limitations found in Appellants' independent claim 1.

First, appellants assert that the examiner has improperly given the word "essentially" found in the claim limitation "essentially a drop" an unreasonably broad interpretation that appears to include any number of drops greater than two. Appellants have and continue to argue that a proper interpretation of "essentially a drop" is "about a drop," more than a drop in some cases but not many drops. In support of their position, appellants cite their specification:

"[e]ach activation of a fluid ejector results in the ejection of a precise quantity of fluid in the form of essentially a fluid drop with the drop ejected substantially along fluid ejection axis 148. Each fluid drop may include primary drop 146 as well as possible secondary drops 144. Both the generation and size of the secondary drops depends on various parameters such as the firing frequency of fluid ejector 126, the surface tension of the fluid being ejected, the size and shape of nozzle 142, and the size, shape, and location of fluid ejector 126 to nozzle 142. The number of times the fluid ejector is activated, in this

embodiment, controls the number of drops ejected (Specification

Page 5, lines 21-29).

The examiner has considered appellants' arguments and support, and concludes that the rejection is valid, wherein the examiner has given the pending claims their broadest reasonable interpretation consistent with (1) the specification, and (2) the interpretation that those skilled in the art would reach (See MPEP § 2111).

The phrase "essentially a drop" interpreted in light of the appellants above cited portion of the specification clearly sets forth that the proper interpretation of "essentially a drop" includes "primary drop as well as secondary drops," i.e. each fluid drop may include greater than two drops. Hence the specification corroborates the examiner's proper interpretation that "essentially a drop" does not exclude the generation of more than one drop.

One of ordinary skill would construe "essentially a drop" to mean that the claimed method generates one or more drops, but does not necessarily eject only one drop. Additionally appellants recite the transitional phrase "comprising," which is inclusive or open-ended and does not exclude additional, unrecited elements or method steps. The word 'comprising' transitioning from the preamble to the body signals that the entire claim is presumptively open-ended. Hence, as previously stated , the claim does not exclude the generation of more than one drop. Further, the generation of one million drops is considered to be within the scope of the claim as per MPEP § 2111.03.

In response to appellants argument that "essentially" should be interpreted to have a meaning similar to that of the word "about," the examiner notes that the word "about" permits some tolerance, and allows for values slightly above and below a particular value (See MPEP § 2144.05). Hence the claimed phrase does not exclude more than one drop. Assuming arguendo that the term "essentially" is interpreted similar to the word "about," the phrase "essentially a drop"

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allows for less than a drop and more than a drop. Hence the claimed phrase does not exclude more than one drop.

Second, appellants assert that Loughman does not disclose activating a fluid ejector at a frequency greater than 10kHz. In support of their argument, appellants have cited Loughman as disclosing, "nebulizer probe nebulizes at a frequency of 12 to 36 kHz" (pg. 9 line 34 to pg. 10 line 3). Appellants have argued that Loughman continuously operates at a set frequency, whereas appellants activate at a set frequency.

The examiner has considered appellants' arguments and support, and concludes that the rejection is valid. Appellants claim merely requires activation above a set frequency, the claim language utilized by appellants does not exclude continuous operation above a set frequency as evidenced by appellants usages of the term "consisting" (see above discussion of the term consisting). Loughman discloses drop generation (nebulization) at a frequency of 12-36 kHz, wherein each time the nebulizer is turned on the frequency is set within the disclosed range, hence the nebulizer of Loughman activated at a frequency of greater than 10 kHz.

Third, appellants strongly disagree with Examiner that Loughman discloses for each drop of first fluid ejected into the second fluid, the result is the generation of a microcapsule in the second fluid as claimed by appellants. In support of their argument appellants have cited various portions of the Loughman reference.

The examiner has considered appellants' arguments and support, and concludes that the rejection is valid. The examiner notes that in the encasing process of Loughman, the microdroplets (composed of the first fluid) are introduced via the fluid ejector into a cooled non-solvent medium (second fluid), the result is encasing of the bound microparticles. The second fluid extracts the solvent from the particles; the droplets freeze immediately upon contact with the slurry (second

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fluid) (page 10, lines 34), hence, forming microspheres. Appellants recognize that Loughman also discloses that the "number of the original bound microparticles in the encased microparticles can vary from 1 to several hundred" (pg. 10, lines 5-6). However, this disclosure is considered irrelevant to the issue of whether or not upon ejection of the first fluid into the second fluid the result is a microcapsule, because as mentioned in the rejection above, the first fluid is considered to be the bound microparticles in an absorbable encasing polymer solution, and the second fluid is the slurry.

Claims 46, 47, and 2:

Appellants have essentially argued that the ultrasonic atomizer of Loughman does not generate a drop and is not considered a drop on demand fluid ejector. Appellants further argue that drop on demand fluid ejectors are well known in the art and one of ordinary skill would not consider an ultrasonic atomizer as a drop on demand fluid ejection device.

The examiner has considered appellants' arguments and support, and concludes that the rejection is valid. Careful analysis and interpretation of each of the claims (46, 47, and 2) reveals that appellants have defined in the claim the requirements of a drop on demand fluid ejector. Appellants claim a drop on demand fluid ejector device and require that the device ejects essentially a drop of fluid. Upon consideration of the totality of all the limitations of the claim and their interaction with each other, one of ordinary skill in the art would be reasonably apprised of the scope of the invention. Clearly, the claim provides the standard for determining what explicitly must be present in the drop on demand fluid ejector, and one of ordinary skill in the art would reasonably comprehend that the only requirement of the claimed drop on demand fluid ejector is that the device is capable of generating essentially a drop of fluid. As the examiner has set forth above, essentially a drop does

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not exclude more than one drop, and the Loughman reference specifies that the ultrasonic atomizer or nebulizer generates droplets (pg. 10, lines 32-34). Hence meeting the claimed limitations.

The examiner recognizes that the term "drop on demand fluid ejection device" when given the broadest reasonable interpretation consistent with (1) the specification, and (2) the interpretation that those skilled in the art would reach, is not equivalent to the definition provided by appellant in the claim. However, this contradiction is readily resolved by allowing the claimed subject matter to control and surpass the broadest reasonable interpretation.

Further, with regards to claim 46, appellants have argued that Loughman does not disclose producing a distribution of drop volume where each drop is within about 10% of a specified drop volume. The examiner has considered appellants' arguments and support, and concludes that the rejection is valid. The drop distribution is an inherent property of the nozzle and frequency of the fluid ejection device. Wherein if the prior art and the claimed device have identical or similar nozzles and operate at identical or similar frequencies, the claimed drop distribution is inherently present in both the claimed device and prior art device. In reference to the nozzle, the prior art device and the claimed device both produce drops within the volume range of 1 atto-liter to about 1 pico-liter, hence the nozzles, which control the drop volume, are considered identical. In reference to the frequency, the prior art device and the claimed device both operate a frequency of greater than 10 kHz. Hence, since the prior art device and the claimed device are identical with respect to both the nozzle and frequency, it is inherent that the drop distribution is identical. Hence meeting the claimed limitation.

Claims 4-6:

See Response to Arguments under claim 1.

Claims 12 and 13:

In response to appellant's argument that Loughman does not disclose an electrical pulse charging an nozzle, it is noted that Loughman would envisage employment of any suitable ultrasonic atomizer including an electric discharging atomizer having the properties as claimed.

Claims 17 and 18:

In response to appellant's argument that Loughman does not disclose a nozzle formed in a nozzle layer, as in claims 17 and 18, it is noted that Loughman discloses that the first fluid is contained in an homogenizer and is then feed into an ultrasonic atomizer nozzle. Loughman's homogenizer is the chamber of appellant, and has a volume greater than the nozzle. Examiner takes the position that the disclosure of one nozzle by Loughman constitutes a nozzle layer.

**35 USC § 103**

Claims 3, 9-10, and 48:

In response to appellant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the appellant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

In response to appellant's argument that the no motivation exists to combining Loughman and Boucher, the fact that appellant has recognized another advantage which would flow naturally

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from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious. See *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985).

In response to appellant's argument that Boucher is nonanalogous art, it has been held that a prior art reference must either be in the field of appellant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the appellant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this case, both Loughman and Boucher are drawn to the art of fluid ejection , which is clearly in appellant's field of endeavor.

Appellant argues that Boucher does, teach, or suggest "activating a fluid ejector at a frequency greater than 10 kilohertz [and] ejecting essentially a drop of said first fluid into a second fluid, said drop having a volume; and generating a microcapsule in said second fluid for each drop of said first fluid ejected." In response, examiner has utilized the Boucher reference to teach or suggest the various deficiencies of the Loughman reference, as provided in the detailed rejection above. Examiner has not utilized the Boucher refernce for disclosure of the above quoted subject matter, rather this matter was disclosed by Loughman as discussed above.

Claims 15-16, 19-28, and 50-55:

In response to appellants argument that the claimed limitations are not taught by Loughman, as in the above rejection, the examiner has set forth a particular motivation for each claim which would allow Loughman to readily contemplate incorporation of each limitation. Appellants have not clearly point out the patentable novelty which he or she thinks the claims present in view of the state of the art disclosed by the references cited or the objections made.

**(11) Related Proceeding(s) Appendix**

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,



Saira B. Haider



James J. Seidleck  
Supervisory Patent Examiner  
Technology Center 1700

Conferees:



James Seidleck

Jennifer Kolb-Michener